

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A method for identifying whether a target agent is present in a biological sample comprising:
forming a mixture by mixing capture beads, each having at least one transport probe affixed thereto, reporter beads, each having at least one signal probe affixed thereto, and a biological sample, under binding conditions so as to permit formation of a dual bead complex if the target agent is present in the sample, the reporter bead and capture bead each being bound to the target agent;
~~isolating the dual bead complex from the mixture to obtain an isolate;~~
exposing the ~~isolate~~ dual bead complex to a capture field on a disc by rotating the disc so as to move the dual bead complex to the capture field, the capture field having a capture agent that binds to the dual bead complex; and
detecting the presence of the dual bead complex in the disc to indicate that the target agent is present in the sample.
2. (Currently amended) The method of claim 1, wherein the capture beads are magnetic and ~~the isolating wherein~~ the dual bead complex ~~includes~~ is isolated by subjecting the mixture to a magnetic field.
3. (Original) The method of claim 2, wherein the magnetic field is applied while the capture beads and reporter beads are on the disc.
4. (Original) The method of claim 2, wherein the capture beads and reporter beads are mixed off the disc and the magnetic field is applied to the mixture of the sample and the beads off the disc.
5. (Withdrawn) The method of claim 2, wherein the capture beads, reporter beads, and sample are mixed together and then a magnetic field is applied after the mixing.

6. (Withdrawn) The method of claim 2, wherein the capture beads and sample are mixed together, a magnetic field is applied to form a first isolate, and then the first isolate is mixed with the reporter beads and a magnetic field is applied to form a second isolate.

7. (Previously presented) The method of claim 1, wherein the detecting the presence of the dual bead complex includes directing light to the capture field and detecting light reflected from the capture field.

8. (Withdrawn) The method of claim 1, wherein the detecting includes directing light to the capture field and detecting light transmitted past the capture field to a detector.

9. (Previously presented) The method of claim 1, wherein the reporter beads are fluorescent, and the detecting the presence of the dual bead complex further comprises directing light at a first wavelength and detecting light at a second wavelength.

10. (Original) The method of claim 1, wherein the target agent includes a nucleic acid or a protein.

11. (Previously presented) The method of claim 10, wherein the target agent includes a nucleic acid, and each of the transport probe and the signal probe includes a nucleic acid molecule complementary to the target nucleic acid.

12. (Withdrawn) The method of claim 10, wherein the target agent includes a protein, and wherein each of the transport probe and the signal probe includes an antibody that specifically binds the target protein.

13. (Previously presented) The method of claim 1, wherein the biological sample is selected from the group consisting of blood, serum, plasma, cerebrospinal fluid, breast aspirate, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, urine, saliva, amniotic fluid, semen, mucus, a hair, feces, a biological particulate suspension, a single-stranded or double-stranded nucleic acid molecule, a cell, an organ, a tissue, and a tissue extract.

14. (Previously presented) The method of claim 1, wherein the reporter beads comprise latex, gold, plastic, steel, or titanium.

15. (Original) The method of claim 1, wherein the reporter bead is fluorescent.

16. (Currently amended) The method of claim ~~14~~ 1, wherein the mixing is intermittent and not continuous.

17. (Original) The method of claim 1, wherein the transport probes comprise one or more probes selected from the group consisting of: single-stranded DNA, double-stranded DNA, single-stranded RNA, peptide nucleic acid, biotin, streptavidin, an antigen, an antibody, a receptor protein and a ligand.

18. (Original) The method of claim 1, wherein the dual bead complex specifically binds to the capture agent via the signal probe or the reporter bead or any combination thereof.

19. (Original) The method of claim 1, wherein one of the reporter bead and signal probe is biotinylated and the capture agent is streptavidin or neutravidin.

20. (Currently amended) The method of claim 1, ~~wherein the exposing includes rotating the disc to move the dual bead complex to the capture field, the method further including~~ further comprising rotating the disc in order to cause unbound dual bead complex to be moved away from the capture field.

21. (Previously presented) The method of claim 1, wherein the capture agent is affixed to a capture layer via an amino group or a thiol group.

22. (Previously presented) The method of claim 1, wherein the target agent is selected from the group consisting of a nucleic acid characteristic of a disease, a nucleic acid having a nucleotide sequence specific for a person, a nucleic acid having a nucleotide sequence specific for an organism, a nucleic acid molecule associated with cancer in a human, an antibody which is present only in a subject infected with HIV-1, a viral protein antigen, and a protein characteristic of a disease state in a subject.

23. (Original) The method of claim 1, wherein the target agent includes a nucleic acid having a nucleotide sequence specific for an organism, and the organism is a bacterium, a virus, a mycoplasma, a fungus, a plant, or an animal.

24. (Previously presented) The method of claim 1, wherein the capture beads include a first group of capture beads and a second group of capture beads, the first group of capture beads and the second group of capture beads being different.

25. (Previously presented) The method of claim 1, wherein the reporter beads include a first group of reporter beads and a second group of reporter beads, the first group of reporter beads and the second group of reporter beads being different.

26. (Previously presented) The method of claim 1, wherein the dual bead complex is in a chamber within the disc, the chamber including a first capture field and a second capture field coupled to the first capture field.

27. (Previously presented) The method of claim 26, further comprising providing a first capture agent in the first capture field, and a second capture agent, different from the first capture agent, in the second capture field, and the chamber thereby being adapted to detect either or both of two different target agents.

28. (Previously presented) The method of claim 26, further comprising providing a first capture agent and a second capture agent, different from the first capture agent, in the same capture field, and the capture field thereby being adapted to detect either or both of two different target agents.

29-60. (Canceled)

61. (New) A method of identifying whether a target agent is present in a biological sample comprising:

mixing magnetic capture beads, each having at least one transport probe affixed thereto, reporter beads, each having at least one signal probe affixed thereto, and a biological sample, under binding conditions so as to permit formation of a dual bead complex if the target agent is present in the sample, the reporter bead and capture bead each being bound to the target agent;

isolating the dual bead complex from the mixture by subjecting the mixture to a magnetic field so as to obtain an isolate;

exposing the isolate to a capture field on a disc, the capture field having a capture agent that binds to the dual bead complex; and

detecting the presence of the dual bead complex in the disc to indicate that the target agent is present in the sample.

62. (New) The method of claim 61, wherein the magnetic field is applied while the capture beads and reporter beads are on the disc.

63. (New) The method of claim 61, wherein the capture beads and reporter beads are mixed off the disc and the magnetic field is applied to the mixture of the sample and the beads off the disc.

64. (New) The method of claim 61, wherein the capture beads, reporter beads, and sample are mixed together and then a magnetic field is applied after the mixing.

65. (New) The method of claim 61, wherein the capture beads and sample are mixed together, a magnetic field is applied to form a first isolate, and then the first isolate is mixed with the reporter beads and a magnetic field is applied to form a second isolate.

66. (New) The method of claim 61, wherein the detecting the presence of the dual bead complex includes directing light to the capture field and detecting light reflected from the capture field.

67. (New) The method of claim 61, wherein the detecting includes directing light to the capture field and detecting light transmitted past the capture field to a detector.

68. (New) The method of claim 61, wherein the reporter beads are fluorescent, and the detecting the presence of the dual bead complex further comprises directing light at a first wavelength and detecting light at a second wavelength.

69. (New) A method of identifying whether a target agent is present in a biological sample comprising:

mixing a first group of capture beads and a second group of capture beads, the first group of capture beads and the second group of capture beads being different, and each capture bead having at least one transport probe affixed thereto, reporter beads, each having at least one signal probe affixed thereto, and a biological sample, under binding conditions so as to permit formation of a dual bead complex if the target agent is present in the sample, the reporter bead and capture bead each being bound to the target agent;

isolating the dual bead complex from the mixture to obtain an isolate;

exposing the isolate to a capture field on a disc, the capture field having a capture agent that binds to the dual bead complex; and

detecting the presence of the dual bead complex in the disc to indicate that the target agent is present in the sample.

70. (New) The method of claim 70, wherein the reporter beads include a first group of reporter beads and a second group of reporter beads, the first group of reporter beads and the second group of reporter beads being different.

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71. (New) The method of claim 70, wherein the dual bead complex is in a chamber within the disc, the chamber including a first capture field and a second capture field coupled to the first capture field.

72. (New) The method of claim 72, further comprising providing a first capture agent in the first capture field, and a second capture agent, different from the first capture agent, in the second capture field, and the chamber thereby being adapted to detect either or both of two different target agents.

73. (New) The method of claim 72, further comprising providing a first capture agent and a second capture agent, different from the first capture agent, in the same capture field, and the capture field thereby being adapted to detect either or both of two different target agents.